Nursing Students' Perceived Levels of Clinical Stress, Stress Responses and Coping Behaviors

Hemşirelik Öğrencilerinin Algılanan Klinik Stres Düzeyi, Stres Cevapları ve Başetme Davranışları

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SUMMARY

Objectives: This study was carried out to determine nursing students' perceived levels of clinical stress, stress responses and coping behaviors during their clinical practice.

Methods: Data were collected using the Perceived Stress Scale, the Physio-Psycho-Social Response Scale and the Coping Behavior Inventory.

Results: According to the Perceived Stress Scale sub-dimensions, stress was caused by lecturers, nurses, homework and workload. It was found that avoidance strategy was used more frequently by students as their perceived stress levels increased.

Conclusion: These findings are important for assisting nursing educators to identify stressful factors in the clinical educational environment and for facilitating a discussion of appropriate solutions.

Keywords: Clinical practice; nursing students; stress.

ÖZET

Amaç: *Bu çalışma hemşirelik öğrencilerin klinik uygulamada algılanan stres düzeyi, stres cevapları ve başetme davranışlarını belirlemek amacıyla yapılmıştır.*

Gereç ve Yöntem: *Çalışma tanımlayıcı kesitsel olarak yapılmıştır. Veriler Algılanan Stres, Biyo-psikososyal Cevap ve Stresle Başetme Davranışları Ölçekleri ile toplanmıştır.*

Bulgular: *Algılanan stres ölçeği alt boyutuna göre öğrencilerin ilk iki sıradaki stres kaynağının öğretim elemanı/hemşire ve ödevlerden ve iş yükünden kaynaklandığı belirlenmiştir. Bununla birlikte öğrencilerin algıladıkları stres düzeyi arttıkça kaçınma stratejisini daha sık kullandıkları görülmüştür.*

Sonuç: *Bu sonuçlar hemşire eğitimcilerin klinik eğitim ortamındaki stres yaratan faktörleri tanımlamaları ve uygun çözüm yollarının tartışılması için önemlidir.*

Anahtar sözcükler: *Klinik uygulama; hemşirelik öğrencileri; stress.*

Introduction

The nursing education program is a planned curriculum with theoretical and clinical components. It is intended to provide nursing education to students by imparting knowledge, appropriate attitudes and skills. From the beginning of their educational experiences, nursing students face stressful factors that influence their academic performance and quality of life.[1,2] Research on the identification of common sources of stress among nursing students first began thirty years ago.[1–8] The findings showed that common sources of stress emerged at the beginning of the students' educational lives in the clinical sphere and included: encountering death and dying patients, caring for sick people, lacking self-confidence during practical applications, the fear of doing something wrong, problems with using medical instruments, the fear of negative reactions by dying or suffering patients, insufficient support from instructors during clinical activities and relationships with others in their institutions (i.e., doctors, nurses, etc.).[8–14]

It is widely recognized that the exposure of nursing students to long-term and uncontrollable stress negatively affects the development of their professional identity and their health,[1,14,15] reduces their academic achievement by impairing their thinking and decision-making capabilities[16,17] and exposes them to high health risks including those of hypertension, heart disease and immune deficiency.[18] These effects are directly associated with the adequacy of individual coping behaviors.[19,20] It has been reported that effective use of coping strategies protects health.[21] However, local and international studies of nursing students have shown that students do not make use of effective coping strategies against stress.[1,11,13,21,22] For instance, Deary, Watson and Hogston[23] reported that nursing students who exhibited emotion-oriented and avoidant coping behavior had higher stress levels than those who used more effective coping strategies.

It is important for students to develop effective coping behaviors to deal with stress since this enables them to ben-

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efit optimally from their education and to develop a positive professional identity.[14,24,25]

Instructors' support for their students' development of their self-awareness and ability to cope with stress may reduce its negative effects on them.[1,22] Therefore, it is important to determine students' stress levels and identify their stressors and their coping strategies in order to enable the development of necessary behavioral changes in the education process and thus, control over sources of stress. Several studies were conducted to determine the clinical stress levels of nursing students.[1,21,26,27] Studies of the clinical stress levels, stress sources and coping behavior of nursing students in Turkey, however, are limited.[13,14] This study's results are expected to provide important data about the stressors of Turkish nursing students and their reactions to stress.

This study aimed to determine nursing students' perceived level of clinical stress, stress responses and coping behaviors during their clinical practice by seeking answers to these research questions:

1. What are the nursing students' perceived clinical stress levels?

2. Do the students' perceived levels of stress, bio-psycho-social stress responses and coping behaviors vary significantly by their socio-demographic characteristics?

3. Is there a relationship between stress levels and coping behaviors?

Materials and Method

Design and Sample

A cross-sectional study design was used. All of the 1,050 undergraduate nursing students enrolled in the nursing departments of four Turkish universities located in the Marmara and Western Black Sea regions during the academic year 2011–2012 were invited to participate in the study. The data were collected from April to June 2012. A total of 967 students studying at the four nursing schools during the data collection period were given the data collection tools. Only the data collection tools that were filled out completely and did not include extreme values were evaluated: 876 questionnaires for the completed Perceived Stress Scale (PSS), 936 for the Physio-Psycho-Social Response Scale (PPSRS) and 906 for the Coping Behavior Inventory (CBI).

Data Collection

The study was conducted at four universities in different cities. Data collection was performed by the authors and seven lecturers at the universities. Before the data collection, the lecturers were informed about the data collection method and its purpose. Standardized data collection tools were administered to students in their classes. Beforehand, the participants were informed about the aim and procedures of the study, and their questions were answered. The survey response period lasted for approximately 20 minutes. Participation in the study was voluntary, and no fees were paid to the participants. The data were collected from the nursing students using a questionnaire on the participants' socio-demographic information (i.e., gender, age, and perceived academic achievement), the PSS, the PPSRS and the CBI.

Instruments

The Perceived Stress Scale (PSS): The original version of this scale was developed by Sheu et al.[27] and was in Chinese. A Turkish translation of the English version of the scale consisting of 29 items[1] was used for this study, with the authors confirming its validity and reliability. The Cronbach's alpha coefficient of the Turkish version of the scale was found to be 0.93 with a two-week test-retest reliability of 0.96.[28]

The Physio-Psycho-Social Response Scale (PPSRS): This scale, developed by Sheu et al.,[27] contains 21 items about symptoms relating to the students' physical, psychological and social health.[26] The Cronbach's alpha coefficient for this scale was 0.90 with a one-week test-retest reliability of 0.72,[1] with the authors confirming the validity and reliability of the Turkish version of the scale. The Cronbach's alpha coefficient of the Turkish version was found to be 0.91 with a two-week test-retest reliability of 0.92.[28]

The Coping Behavior Inventory (CBI): This scale, consisting of 19 items, was also developed by Sheu et al.[27] The four-factor structure of this scale accounted for 38.2% of the total variance. Its Cronbach's alpha coefficient was 0.76 with one-week test-retest reliability values of 0.57, 0.57, 0.59 and 0.55.[1] The validity and reliability of the Turkish version of the scale was confirmed by the authors, and its Cronbach's alpha coefficient was found to be 0.69 with a two-week test-retest reliability of 0.52.[28]

Ethical Considerations

This study was approved by the Duzce University Ethics Committee (2012/260, 2012/261, 2012/262). Formal permission was obtained from the educational institutions where the study was conducted. The participants received information about the research objectives and procedures, and their written permission was obtained by means of an informed consent form prior to data collection. Some of the PSS, PPSRS and CBI data from the nursing students were used in this study.[28]

Statistical Analyses

Descriptive statistics were computed as mean±SD (standard deviation) for numerical variables such as scores on the scales. Numbers, percentages and frequencies were used for categorical variables such as gender. One-way ANOVA

was used, followed by Tukey's post hoc test, for differences by school, year of study, gender, perceived academic achievement, smoking and alcohol use for the PSS, PPSRS and CBI scores. The linear relationships between the total PSS score and the four CBI sub-dimension scores were determined by using the multiple linear regression model. In this model, the total PSS score was used as the dependent variable, and the four CBI sub-dimension scores as independent variables. The independent samples t-test was used to compare the mean PSS scores obtained by this study with those of other studies.

If the p values of the statistical tests were lower than or equal to 0.05, they were accepted as statistically significant. PASW 18 and Minitab 15 were used for the data analyses.

Results

Of the students who participated in this study, 34% were from the nursing school (4), 34% were freshmen, 80% were female and 71% perceived their academic achievement as mediocre. A total of 14% of the students smoked, and 12% drank alcohol.

Table 1 shows a significant difference between the scores on the sub-dimensions and the total mean PSS scores obtained by this study and those of studies conducted in other countries.

Table 2 shows the differences among the schools concerning stress caused by assignments and workload (p<0.001), by instructors and nursing staff (p<0.001) and by peers and daily life (p=0.04). The sub-dimensions of the PSS and the total PSS scores were found to be statistically significant (p<0.001). According to pairwise comparisons, the stress levels of school 2 was higher than those of the other schools for these four results. Significant differences were seen among the stress levels measured by the subscales of the PSS, which include lack of professional knowledge and skills (p<0.001), instructors and nursing staff (p=0.04), the environment (p=0.02) and peers and daily life (p=0.05).

The significant differences by year of study are indicated in Table 2 by different symbols next to the mean±SD. It was found that the stress scores stemming from lack of professional knowledge and skills and the environment were high in the first year, while the stress caused by instructors and nursing staff and due to peers and daily life were the lowest. The stress experienced while providing patient care was higher in the first and second years. Significant differences between the genders were observed with regard to all the sub-dimensions and the total mean scores, except for the sub-dimension of stress stemming from lack of professional knowledge and skills. Female stress levels were higher in all significant results.

Significant differences were found by perceived academic achievement level for stress stemming from lack of professional knowledge and skills (p<0.001), stress experienced while providing patient care (p=0.01), stress from assignments and workload (p=0.05), stress caused by instructors and nursing staff (p<0.001) and stress from the environment (p=0.03) and total average scores (p<0.001). The stress levels were lower among the students who perceived their academic achievement as high. A significant difference was found for smokers in the sub-dimensions of stress from lack of professional knowledge and skills (p=0.03) and from the environment (p<0.001). The stress levels of the students who smoked were lower. Significant differences were found for alcohol consumption in the sub-dimensions of stress from lack of professional knowledge and skills (p=0.01), providing patient care (p=0.01), assignments and workload (p=0.02) and the environment (p<0.001) and the total average scores (p=0.01). The stress levels of the students who did not drink alcohol were found to be higher (Table 2).

Significant differences were found between universities for mean scores on the entire PPSRS and all its sub-dimensions. The stress levels of school 2 were higher than the other universities for all results (Table 3). . There were signifi-

Table 1. A Comparison of This Study's Average Scores on the Perceived Stress Scale with Those of Other Studies

Perceived Stress Scale (PSS)	Sheu S. et al. 2002[1] (n=544)		Chan C.K.L. et al. 2009[21] (n=205)		Jimenez C. et al. 2010[26] (n=357)		Shaban I.A. et al. 2012[29] (n=181)		This study (n=876)
	Mean±SD	*p	Mean±SD	*p	Mean±SD	*p	Mean±SD	*p	Mean±SD
1. Stress from lack of professional knowledge and skills	2.34±0.53	<.01	2.34±0.63	<.01	1.94±0.69	<.01	1.72±1.01	<.01	2.12±1.19
2. Stress from taking care of patients	2.15±0.53	<.01	2.20±0.50	<.01	2.17±0.83	<.01	1.49±0.74	<.01	2.37±0.95
3. Stress from assignments and workload	1.93±0.64	<.01	2.21±0.61	<.01	1.70±0.80	<.01	2.34±0.88	<.01	2.54±0.96
4. Stress from teachers and nursing staff	1.52±0.58	<.01	1.91±0.55	<.01	1.64±0.84	<.01	1.77±0.93	<.01	2.52±0.95
5. Stress from the environment	1.38±0.67	<.01	2.08±0.66	<.01	1.68±0.87	<.01	1.88±0.80	<.01	2.30±1.11
6. Stress from peers and daily life	1.00±0.65	<.01	1.86±0.60	<.01	1.60±1.22	<.01	1.67±0.91	<.01	2.20±1.05
Total Score	1.75±0.43	<.01	2.10±0.44	<.01	1.87±0.64	<.01	–	–	2.37±0.84

*Six sub-dimension scores and average scores on the Perceived Stress Scale (PSS) obtained by this study were compared with results of the other studies. The P values in each column show the results of these comparisons.

Table 2. The Distribution of the Nursing Students' Mean Scores on the Perceived Stress Scale

Factors			Perceived Stress Scale (PSS)						
	n	%	1. Stress from lack of professional knowledge and skills	2. Stress from patient care	3. Stress from assignments and workload	4. Stress from instructors and nursing staff	5. Stress from the environment	6. Stress from peers and daily life	PSS total score
			Mean±SD	Mean±SD	Mean±SD	Mean±SD	Mean±SD	Mean±SD	Mean±SD
Schools									
School 1	190	21	5.95±3.86	18.88±7.60	13.03±4.79$^{\#}$	14.66±5.74$^{\#}$	6.67±3.41	8.23±4.37$^{\#}$	67.44±24.32$^{\#}$
School 2	163	18	6.50±3.80	20.24±8.34	14.41±4.77$^{\delta}$	17.06±5.70$^{\delta}$	7.44±3.46	9.46±4.28$^{\delta}$	75.08±24.48$^{\delta}$
School 3	231	27	6.39±3.35	18.55±7.28	12.17±4.72$^{\#}$	14.22±5.63$^{\#}$	6.74±3.15	8.65±4.05$^{\delta\#}$	66.74±23.49$^{\#}$
School 4	292	34	6.57±3.48	18.80±7.56	12.01±4.71$^{\#}$	15.14±5.65$^{\#}$	6.89±3.32	8.95±4.20$^{\delta\#}$	68.42±24.85$^{\#}$
	876	100	$F_{3, 872}$=1.24 p=0.29	$F_{3, 872}$=1.72 p =0.151	$F_{3, 872}$=10.400 p=0.00	$F_{3, 872}$=8.326 p=0.00	$F_{3, 872}$=1.926 p=0.12	$F_{3, 872}$=2.759 p=0.04	$F_{3, 872}$=4.378 p=0.00
Grade									
First grade	289	34	7.16±3.44$^{\#}$	19.33±7.85	12.69±5.05	14.41±6.00$^{\#}$	7.32±3.34$^{\#}$	8.25±4.29	69.19±25.11
Second grade	223	25	6.43±3.48$^{\#\delta}$	19.87±7.21	13.07±4.57	15.78±5.48$^{\delta}$	6.94±3.29$^{\#\delta}$	9.11±4.19	71.22±23.12
Third grade	202	23	5.76±3.71$^{\delta}$	18.45±7.49	12.72±4.59	15.20±5.48$^{\#\delta}$	6.74±3.20$^{\#\delta}$	9.05±4.11	67.94±24.14
Fourth grade	161	18	5.72±3.61$^{\delta}$	18.04±8.00	12.26±4.99	15.49±5.89$^{\#\delta}$	6.35±3.45$^{\delta}$	9.12±4.24	67.00±25.45
	875	100	$F_{3, 871}$=8.59 p=0.00	$F_{3, 871}$=2.34 p=0.07	$F_{3, 871}$=0.88 p=0.44	$F_{3, 871}$=2.67 p=0.04	$F_{3, 871}$=3.21 p=0.02	$F_{3, 871}$=2.581 p=0.05	$F_{3, 871}$=1.104 p=0.34
Gender									
Female	695	80	6.45±3.63	19.50±7.49	13.14±4.66	15.42±5.62	7.10±3.32	9.03±4.21	70.65±23.73
Male	179	20	6.09±3.43	17.17±8.06	11.05±5.04	14.00±6.09	6.12±3.26	7.96±4.20	62.41±26.16
	874	100	$F_{1, 871}$=1.38 p=0.23	$F_{1, 871}$=13.33 p=0.00	$F_{1, 871}$=27.66 p=0.00	$F_{1, 871}$=8.79 p=0.00	$F_{1, 871}$=12.3 p=0.00	$F_{1, 871}$=9.08 p=0.00	$F_{1, 871}$=16.44 p=0.00
Perceived academic achievement									
Low	141	16	6.78±3.64$^{\#}$	20.33±8.20$^{\#}$	13.38±5.23$^{\#}$	16.36±5.82$^{\#}$	7.12±3.46$^{\#}$	8.97±4.21	72.96±25.11$^{\#}$
Middle	613	71	6.48±3.51$^{\#}$	19.03±7.39$^{\#}$	12.72±4.65$^{\#}$	15.06±5.62$^{\delta}$	6.99±3.30$^{\#\delta}$	8.86±4.11	69.16±23.70$^{\delta\#}$
High	117	13	5.31±3.84$^{\delta}$	17.44±8.16$^{\delta}$	11.91±5.09$^{\delta}$	14.06±6.17$^{\delta}$	6.15±3.30$^{\delta}$	8.51±4.85	63.41±26.87$^{\delta}$
	871	100	$F_{2, 868}$=6.35 p=0.00	$F_{2, 868}$=4.57 p=0.01	$F_{2, 868}$=2.97 p=0.05	$F_{2, 868}$=5.30 p=0.00	$F_{2, 868}$=3.47 p=0.03	$F_{2, 868}$=0.43 p=0.65	$F_{2, 868}$=4.95 p=0.00
Smoking									
Smoker	126	14	5.75±3.76	17.82±8.22	12.21±5.15	14.86±6.09	6.04±3.60	8.69±4.63	65.39±26.61
Non-smoker	750	86	6.48±3.56	19.22±7.54	12.80±4.76	15.19±5.69	7.05±3.26	8.84±4.16	69.61±24.04
	876	100	$F_{1, 874}$=4.52 p=0.03	$F_{1, 874}$=3.62 p=0.05	$F_{1, 874}$=1.64 p=0.20	$F_{1, 874}$=0.34 p=0.55	$F_{1, 874}$=9.90 p=0.00	$F_{1, 874}$=0.14 p=0.70	$F_{1, 874}$=3.22 p=0.07
Alcohol use									
None	685	79	6.57±3.53$^{\#}$	19.40±7.49$^{\#}$	12.94±4.72$^{\delta}$	15.34±5.70	7.11±3.27$^{\delta}$	8.89±4.15	70.28±24.04$^{\delta}$
Some	80	9	5.71±4.02$^{\#\delta}$	17.95±8.17$^{\#\delta}$	11.72±4.98$^{\delta}$	14.60±6.11	6.16±3.55$^{\delta}$	8.36±4.37	64.51±25.58$^{\#\delta}$
Constantly	108	12	5.70±3.52$^{\delta}$	17.33±8.11$^{\delta}$	12.03±5.16$^{\delta}$	14.36±5.67	6.12±3.37$^{\delta}$	8.75±4.58	64.32±25.32$^{\delta}$
	873	100	$F_{2, 870}$=4.35 p=0.01	$F_{2, 870}$=4.30 p=0.01	$F_{2, 870}$=3.55 p=0.02	$F_{2, 870}$=1.76 p=0.172	$F_{2, 870}$=6.33 p=0.00	$F_{2, 870}$=0.58 p=0.55	$F_{2, 870}$=4.29 p=0.01

$^{\#\gamma\delta}$The different symbols in the columns show categories with statistically significant differences. SD: Standard deviation.

cant differences among the students by perceived academic achievement for their mean scores on the entire PPSRS and its sub-dimensions (all p values<0.05). The students who perceived their academic achievement as being low had higher stress levels.

Table 4 presents the significant differences among universities with regard to mean scores on the CBI sub-dimensions. The school 2 students were found to have lower scores on staying optimistic, transference and problem solving, while their avoidance scores were higher. No significant differences among the students according to their perceived academic achievement was determined in the transference sub-dimension. The students who perceived their academic achievement as high reported better coping behaviors than the others.

The relationship between the total PSS and the CBI sub-dimensions indicated that the transference and avoidance sub-dimensions of the CBI significantly affected the total PSS (p=0.032 and p<0.001, respectively). The results of the multiple linear regression model were: total PSS=55.169 (constant)+0.336 staying optimistic+0.801 transference–0.26 problem solving+1.415 avoidance.

Discussion

The findings obtained by this study show that the stress

Table 3. The Distribution of the Nursing Students' Means Scores on the Physio-Psycho-Social Response Scale

Factors			The Physio-Psycho-Social Response Scale (PPSRS)			
			1. Socio-behavioral symptoms	2.Emotional symptoms	3.Physical symptoms	PPSRS total score
	n	%	Mean±SD	Mean±SD	Mean±SD	Mean±SD
Schools						
School 1	195	20	7.14±5.51$^{\#}$	8.67±6.57$^{\#}$	6.00±5.90$^{\#}$	21.81±16.16$^{\#}$
School 2	172	18	10.59±6.55$^{\delta}$	12.16±7.27$^{\delta}$	7.45±6.74$^{\#\delta}$	30.22±18.39$^{\delta}$
School 3	244	27	8.07±5.46$^{\#}$	9.33±6.74$^{\#}$	6.82±6.18$^{\#\delta}$	24.23±16.51$^{\#}$
School 4	325	35	7.73±5.71$^{\#}$	9.54±7.10$^{\#}$	7.60±6.78$^{\delta}$	24.87±18.10$^{\#}$
	936	100	$F_{3, 932}$=12.81 p=0.00	$F_{3, 932}$=8.91 p=0.00	$F_{3, 932}$=2.846 p=0.03	$F_{3, 932}$=7.541 p=0.00
Perceived academic achievement						
Low	146	15	10.39±6.48$^{\#}$	11.79±7.27$^{\#}$	8.30±7.06$^{\#}$	30.48±18.90$^{\#}$
Middle	666	73	8.17±5.67$^{\gamma}$	9.73±6.96$^{\gamma}$	7.03±6.41$^{\#}$	24.93±17.25$^{\gamma}$
High	120	12	5.82±5.27$^{\delta}$	7.49±6.39$^{\delta}$	5.44±5.60$^{\delta}$	18.75±15.26$^{\delta}$
	932	100	$F_{2, 929}$=20.73 p=0.00	$F_{2, 929}$=12.67 p=0.00	$F_{2, 929}$=6.52 p=0.00	$F_{2, 929}$=12.16 p=0.00

$^{\#\gamma\delta}$The symbols in the columns show categories with statistically significant differences. SD: Standard deviation.

Table 4. The Distribution of the Nursing Students' Means Scores on the Coping Behavior Inventory

Factors			The Coping Behavior Inventory (CBI)			
			1. Staying optimistic	2. Transference	3. Problem-solving	4. Avoidance
	n	%	Mean±SD	Mean±SD	Mean±SD	Mean±SD
Schools						
School 1	192	21	9.26±2.49$^{\#}$	6.27±2.46$^{\#}$	15.73±4.38$^{\#}$	6.20±4.00$^{\#}$
School 2	165	18	8.50±2.51$^{\gamma}$	5.83±2.47$^{\#}$	13.81±5.37$^{\gamma}$	8.03±4.55$^{\gamma}$
School 3	238	26	8.58±2.91$^{\gamma\delta}$	5.82±2.40$^{\#\gamma}$	14.64±5.45$^{\#\gamma}$	6.97±4.57$^{\#\gamma}$
School 4	311	35	8.73±2.76$^{\#\delta\gamma}$	6.41±2.54$^{\#\delta}$	14.58±5.35$^{\#\gamma}$	7.14±4.67$^{\#\gamma}$
	906	100	$F_{3, 902}$=3.05 p=0.02	$F_{3, 902}$=3.61 p=0.01	$F_{3, 902}$=4.19 p=0.00	$F_{3, 902}$=4.92 p=0.00
Perceived academic achievement						
Low	139	15	8.34±2.59$^{\gamma}$	6.16±2.51	13.20±5.23$^{\gamma}$	8.51±4.51$^{\gamma}$
Middle	646	73	8.73±2.71$^{\gamma}$	6.08±2.45	14.61±5.04$^{\#}$	6.99±4.45$^{\#}$
High	117	12	9.52±2.74$^{\#}$	6.28±2.66	16.96±5.49$^{\delta}$	5.79±4.51$^{\delta}$
	902	100	$F_{2, 899}$=6.40 p=0.00	$F_{2, 899}$=0.34 p=0.71	$F_{2, 899}$=17.40 p=0.00	$F_{2, 899}$=12.16 p=0.00

$^{\#\gamma\delta}$The symbols in the columns show categories with statistically significant differences. SD: Standard deviation.

levels of Turkish nursing students were higher than those of their peers in several other countries. The average score of the perceived stress of nursing students in Turkey was significantly higher than those reported in other countries. The average scores were higher than those found in other countries in almost all the sub-dimensions in this study. This demonstrates that Turkish students perceive nursing education as stressful. The fact that stress caused by instructors and nurses and stress stemming from duties and workload were ranked first and second in the current study is another important finding. The sub-dimension of stress caused by instructors and nurses was ranked fourth or fifth in studies conducted in other countries, but was ranked first in this study[1,21,29] (Table 1). This outcome indicates a need to review the teaching and assessment methods used in the Turkish education system, student-instructor relationships and student workload. The high number of students per teaching staff, unsatisfactory work situations,[30] and some difficulties originating with teaching staff may be relevant to these findings.

In this study, the first-year students' scores for stress caused by the environment and lack of professional knowledge and skills were found to be high (Table 2). The studies of Sheu et al.[1] and Pagana[31] support these findings regarding first-year students' experience of stress from lack of knowledge and skills. The initial clinical experiences of first-year nursing students mainly facilitate exposure to essential knowledge and skills. However, students encounter various patients and diseases in clinics and need advanced knowledge and skills to provide care to these patients. The

main source of stress could be the students' feelings of inadequacy with regard to the provision of patient care and their professional knowledge and skills.[1] Moreover, clinics are not always pleasant and enjoyable, particularly for students without previous exposure to clinical work.[32] Students are often deployed to clinical environments where they do not know the health personnel and are not familiar with procedures. In addition, health personnel generally have high expectations of students. Clinical instructors may also have expectations regarding the students' performances. Previous results from numerous studies have indicated that nursing instructors need to explain the objectives and nature of clinical practice in depth in order to protect students from unnecessary stress, to help them establish collaborative relationships with health personnel and to enable them to develop realistic expectations of their initial clinical practice.[22,33]

It was found that, other than in the sub-dimension of stress from lack of professional knowledge and skills, female students experienced higher stress levels than male students in all the sub-dimensions and the total average scores. Similar results were found in a study conducted in another country.[34] This result could be due to the fact that men generally express their emotions and concerns less than women do as well as to gendered differences in psychological morbidity.[35]

Previous studies have demonstrated that high stress levels disrupt students' thinking and decision-making capabilities and thus, decrease academic achievement.[16,21,24] The results in this study were similar to those of studies indicating that the stress levels of students with self-reported low academic achievement were higher than those of other students. Studies conducted in Jordan, Taiwan, and China have shown that students are success-oriented due to the type of culture in those countries.[1,21,29] Given the low academic achievement of the students, this study's findings led to the assumption that their stress levels may have risen as a result of their dissatisfaction with what was expected of them academically.

Among smoking students, the high scores on the sub-dimensions of stress originating from lack of professional knowledge and skills and from the environment demonstrated that smoking was not an effective coping mechanism for dealing with stress. However, the low stress levels found among students who drank alcohol yielded an interesting finding. In a study examining the relationships between student mental health and perceived stressors, it was argued that many students drink alcohol socially or for entertainment and that a small number do so for relaxation. Similarly, the students in this study may have experienced a sense of relief by drinking alcohol. It is widely acknowledged that smoking and alcohol consumption are ineffective coping methods, and that engaging in these activities leads to a negative lifestyle. However, these research findings do not sufficiently explain the relationship between the use of alcohol and student coping methods.[36]

Another study showed that sophomores had more somatic and emotional anxiety and poorer health with more general symptoms than students in other years of study.[11] This study found no difference in nursing students' bio-psycho-social responses to stress by year of study. However, differences were observed among the four universities. The stress levels perceived by students at school 2, their psychosocial responses to stress and the coping strategies they used were found to be significantly different than those of the other students (Table 3). The geographical location, base admission scores, student profiles and curricula across the four universities in this study were similar. Therefore, differences regarding the bio-psycho-social response towards stress were presumably due to specific attributes of the universities. It was observed that students who perceived their academic achievement as low had high total scores on bio-psycho-social response. The physical-emotional and socio-behavioral symptoms of students who experienced stress coupled with a focus on these symptoms may have reduced their academic achievement.

This study showed that nursing students in clinical practice used avoidance as a coping strategy as their perceived stress increased. International studies of nursing students have also shown that students experiencing stress related to their instructors or working nurse personnel exhibited more avoidance behavior.[1,11,21,22,37] In a study conducted in Jordan, nursing students most frequently used problem solving as a coping strategy, while avoidance was used the least. Similarly, in a Taiwanese study, problem solving and staying optimistic were more frequently used than other coping strategies. However, this study found that problem solving and optimistic strategies were rarely used. The use of the problem-solving strategies requires individuals to make an active effort and to generate solutions, unlike the avoidance strategy.[21] Students may use the avoidance strategy, particularly when they do not feel confident.[21] This explains why the students who perceive their academic achievement to be low mostly used avoidance and rarely used problem-solving strategies (Table 4). This also explains why, as found by this study, as stress from a lack of professional knowledge and skills increases, students are less likely to use problem-solving strategies. If students are not experienced in clinical decision making, they may avoid problems or expect them to be solved for them by their instructors.[21] From this perspective, it could be argued that the students who participated in the study did not have self-efficacy in professional knowledge and skills and the ability to generate solutions to problems. The use of avoidance as a coping mechanism can also be linked to student personalities, upbringing and experience with stress.[14] Additional research is needed for

a better understanding of why and how students use avoidance to escape from stress.

Conclusion

The findings obtained by this study show that the stress levels of Turkish nursing students in clinical practice are higher than those obtained by studies in other countries that used the same scales. This study found the PSS subdimensions of stress caused by instructors and nursing staff (2.52±0.95) and by assignments and workload (2.54±0.96) to be higher. Female students with low perceived academic success and students who did not drink alcohol or smoke had higher perceived stress levels. This study found that problem solving and staying optimistic were the least used coping strategies, and that students were more likely to use the avoidance strategy as their levels of perceived stress increased.

Since the stress experienced by nursing students in clinical practice can be influenced by factors such as personality traits and self-respect, there is a need for studies to examine these attributes. In order to strengthen the students' ability to cope with stress, educational programs should be organized in a way that facilitates self-knowledge and the knowledge of situations that can cause stress. There is also a need to increase instructors' levels of awareness about the stress students experience in clinical environments and their coping strategies. In addition to educational programs, psycho-educational and psychological counseling to enhance the coping skills of nursing students can be provided. Qualitative studies are needed to improve our understanding of the causes of the perceived stress levels of nursing students. Results in this area of research are important in order to help nursing education instructors identify stress-inducing factors in clinical education and thus to highlight the importance of generating suitable solutions.

Limitations of the Study

The data obtained by this study were limited to only four university nursing schools. Therefore, they cannot be generalized to all nursing schools.

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